

CLAIMS

We Claim:

1 **1.** A method of transmitting and receiving messages in a network,
2 comprising:

3 transmitting a flow control message header to a transmitting node from a
4 receiving node, wherein the flow control header comprises a message sent field and
5 a message limit field;

6 transmitting a message from the transmitting node to the receiving node and
7 incrementing a send counter;

8 receiving the message by the receiving node and incrementing a consumed
9 credits variable;

10 determining a message was dropped when the message sent field is less than
11 or equal to the value of the consumed credits variable;

12 adjusting the message limit field to compensate for the dropped message; and

13 transmitting the message limit field to the transmitting node.

1 **2.** The method recited in claim 1, wherein the determining a message was
2 dropped further comprises:

3 setting a variable drop count equal to the message sent field less the
4 consumed credits variable;

5 determining if the variable drop count is less than an available credits variable,
6 wherein the available credits variable represents the total amount of space allocated
7 to receive messages from a particular node; and
8 increasing the message limit field value and transmitting the flow control
9 message header to the transmitting node.

1 3. The method recited in claim 2, further comprising:
2 setting a new credits variable equal to the available credits variable plus the
3 new credits; and
4 setting the available credits variable to zero.

1 4. The method recited in claim 3, further comprising:
2 setting a send limit variable equal to the message limit field; and
3 executing a threshold module.

1 5. The method recited in claim 4, wherein the threshold module further
2 comprising:
3 determining if the available credits variable is less than a credit threshold
4 variable; and
5 transmitting the flow control message header to the transmitting node.

1 6. The method recited in claim 1, further comprising:

2 transmitting at a predetermined time interval the flow control message header
3 to the transmitting node, wherein a value contained in the message limit field is
4 increased.

1 7. The method recited in claim 6, wherein the increase in the message limit
2 field further comprises:

3 incrementing send counter and the message sent field;
4 incrementing and available credits variable by a new credits variable, wherein
5 the available credits variable represents the total number of messages the
6 transmitting node may send and the new credits variable represents additional
7 messages that may be transmitted by the transmitting node; and
8 setting the message limit field equal to the consumed credits variable plus the
9 available credits variable.

1 8. The method recited in claim 1, further comprising:
2 determining if a get credit variable is set to true, wherein the get credit variable
3 represents that additional messages may be sent by the transmitting node to the
4 receiving node; and
5 incrementing the available credits variable by the number of additional
6 messages permitted.

1 **9.** An apparatus comprising a data storage medium for storing instructions
2 when executed by a processor results in, comprising:
3 transmitting a flow control message header to a transmitting node from a
4 receiving node, wherein the flow control header comprises a message sent field and
5 a message limit field;
6 transmitting a message from the transmitting node to the receiving node and
7 incrementing a send counter;
8 receiving the message by the receiving node and incrementing a consumed
9 credits variable;
10 determining a message was dropped when the message sent field is less than
11 or equal to the value of the consumed credits variable;
12 adjusting the message limit field to compensate for the dropped message; and
13 transmitting the message limit field to the transmitting node.

1 **10.** The apparatus recited in claim 9, wherein the determining a message
2 was dropped further comprises:
3 setting a variable drop count equal to the message sent field less the
4 consumed credits variable;
5 determining if the variable drop count is less than an available credits variable,
6 wherein the available credits variable represents the total amount of space allocated
7 to receive messages from a particular node; and

8 increasing the message limit field value and transmitting the flow control
9 message header to the transmitting node.

1 **11.** The apparatus recited in claim 10, further comprising:
2 setting a new credits variable equal to the available credits variable plus the
3 new credits variable; and
4 setting the available credits variable to zero.

1 **12.** The apparatus recited in claim 11, further comprising:
2 setting a send limit variable equal to the message limit field; and
3 executing a threshold module.

1 **13.** The apparatus recited in claim 12, wherein the threshold module further
2 comprising:
3 determining if the available credits variable is less than a credit threshold
4 variable; and
5 transmitting the flow control message header to the transmitting node.

1 **14.** The apparatus recited in claim 9, further comprising:
2 transmitting at a predetermined time interval the flow control message header
3 to the transmitting node, wherein a value contained in the message limit field is
4 increased.

1 **15.** The apparatus recited in claim 14, wherein the increase in the message
2 limit field further comprises:

3 incrementing send counter and the message sent field;
4 incrementing and available credits variable by a new credits variable, wherein
5 the available credits variable represents the total number of messages the
6 transmitting node may send and the new credits variable represents additional
7 messages that may be transmitted by the transmitting node; and
8 setting the message limit field equal to the consumed credits variable plus the
9 available credits variable.

1 **16.** The apparatus recited in claim 9, further comprising:
2 determining if a get credit variable is set to true, wherein the get credit variable
3 represents that additional messages may be sent by the transmitting node to the
4 receiving node; and
5 incrementing the available credits variable by the number of additional
6 messages permitted.

1 **17.** A system for transmitting and receiving messages in a network,
2 comprising:

3 a receive done module to determine that all message transmitted have been
4 received based upon a flow control header, wherein the flow control header
5 comprises a message sent field and a message limit field; and

6 a post send module to update an available credits variable, wherein the
7 available credits variable indicates the total number of messages a transmitting node
8 may send to a receiving node.

1 **18.** The system recited in claim 17, wherein the receive done module
2 increments a consumed credits variable and compares the consumed credits
3 variable to the message sent field to determine if a message has been dropped.

1 **19.** The system recited in claim 18, wherein the receive done module will
2 add an additional value to the message limit field when it is determined that a
3 message has been dropped.

1 **20.** The system recited in claim 19, further comprising:
2 a threshold check module to determine if the transmitting node has any
3 available credits remaining and updating the message limit field to include additional
4 credits when no further credits remaining for the transmitting node.

1 **21.** The system recited in claim 19, further comprising:
2 a post receive module to increment a new credit variable and process pending
3 message requests.

- 1 **22.** The system recited in claim 19 , further comprising:
- 2 a periodic update module to determine at a predetermined time interval if a
- 3 transmitting node has run out of credits used to transmit messages with.